

REMARKS

In response to the Final Office Action mailed September 17, 2004, Applicant respectfully requests reconsideration. Claims 1-32 were previously pending in this application. Claims 1, 4, 13, 15, 17, 18, 21, 26, 27, and 31 are amended herein, and claims 3, 16, and 20 are canceled. To further the prosecution of this application, each of the rejections set forth in the Office Action is addressed below. The application as presented is believed to be in condition for allowance.

The Office Action rejected claims 1-32 under 35 U.S.C. §102(e) as purportedly being unpatentable over Cabrera (6,119,131). Applicant respectfully traverses this rejection.

Claim 1

Claim 1, as amended, is directed to a method of accessing one of a plurality of logical volumes stored on a plurality of storage systems in an enterprise, the one of the plurality of logical volumes being stored on at least one of the storage systems, the method comprising steps of: receiving from a host computer an access request to access data stored on the one of the plurality of logical volumes, the access request specifying an enterprise logical volume identifier (ELVID) for the one of the plurality of logical volumes and a physical storage address for the one of the plurality of logical volumes, wherein the ELVID uniquely identifies the one of the plurality of logical volumes among the plurality of logical volumes, so that the ELVID can be used to access the one of the plurality of logical volumes on at least two of the plurality of storage systems, and wherein the physical storage address specifies one of the plurality of storage systems in the enterprise; and in response to the access request, verifying that the one of the plurality of logical volumes corresponding to the ELVID is stored on the one of the plurality of storage systems specified in the physical storage address.

Cabrera does not disclose or suggest, “receiving an access request to access data stored on a logical volume, the access request specifying an enterprise logical volume identifier (ELVID) for the one of the plurality of logical volumes and a physical storage address for the one of the plurality of logical volumes,” as recited in claim 1. Further, Cabrera does not disclose or suggest, “verifying that the one of the plurality of logical volumes corresponding to the

ELVID is stored on the one of the plurality of storage systems specified in the physical storage address,” as recited in claim 1.

Cabrera discloses a method by which drive letter names may be assigned to logical volumes in a computer persistently, so that even if the physical configuration of the devices on which the logical volumes are stored changes, the drive letter name assignments remain the same (Col. 1, lines 19-40). Thus, Cabrera discloses maintaining a persistent table that maps identifiers (that each identifies one of the logical volumes) to the previously-assigned corresponding drive letter names (Col. 6, line 53 - Col. 7, line 6). When the computer is booted, the operating system presents each logical volume to a mount manager in the order in which the device on which the logical volume is stored is detected (Col. 7, lines 23-33). Rather than simply assigning each logical volume a drive letter based on the order in which it is presented, Cabrera discloses that the mount manager queries the logical volume to determine its identifier, searches the persistent table for the identifier of the logical volume, and determines the corresponding drive letter that was previously assigned to that logical volume (Col. 7, lines 29-50). The mount manager then informs the operating system of the association between the drive letter and the device name on which the logical volume corresponding to the identifier is stored (Col. 7, lines 51-58).

The Office Action asserts that the process of determining which drive letter was previously assigned to a logical volume discloses, “verifying that the ELVID corresponds to the physical storage address,” as recited in claim 1. *See Office Action, page 13*. Applicant respectfully disagrees, as assigning drive letters to devices using a persistent map is different from verifying that such an assignment is correct.

However, to further the prosecution of this application, Applicant has amended claim 1 to indicate that the act of verifying that the ELVID corresponds to the physical storage address is performed in response to an access request to access data stored on a logical volume and that the access request specifies the ELVID for the logical volume and a physical storage address, wherein the physical storage address specifies one of the plurality of storage systems in the enterprise. Applicant has further amended claim 1 to clarify that the act of verifying comprises verifying that the one of the plurality of logical volumes corresponding to the ELVID is stored on the one of the plurality of storage systems specified in the physical storage address.

In Cabrera, the assigning of drive letters to devices is only performed upon boot up of the computer. Thus, to the extent that this assignment can be interpreted as “verifying” (which clearly it cannot), such an assignment is not performed in response to a request to access data stored on the logical volume. Further, Cabrera does not disclose or suggest the use of a physical storage address that identifies one of a plurality of storage systems. Cabrera does not even disclose the use of a plurality of storage systems, as Cabrera discloses only a single host computer.

Thus, claim 1 patentably distinguishes over Cabrera. Accordingly, it is respectfully requested that the rejection of claim 1 under 35 U.S.C. §102(e) be withdrawn.

Claims 2 and 4-14 depend from claim 1 and are patentable for at least the same reasons. Accordingly, it is respectfully requested that the rejection of claims 2-14 under 35 U.S.C. §102(e) be withdrawn.

Claim 15

Claim 15 is directed to a method of accessing one of a plurality of logical volumes stored on a plurality of storage systems in an enterprise, the one of the plurality of logical volumes being stored on at least one of the storage systems, the method comprising steps of: receiving from a host computer an enterprise logical volume identifier (ELVID) for the one of the plurality of logical volumes; receiving from the host computer a physical storage address for the one of the plurality of logical volumes; and using the ELVID to assure that an entity requesting access to the one of the plurality of logical volumes is authorized to do so, the ELVID uniquely identifying the one of the plurality of logical volumes among the plurality of logical volumes and being usable to access the one of the plurality of logical volumes on at least two of the plurality of storage systems.

Cabrera fails to disclose or suggest, “receiving from a host computer an enterprise logical volume identifier (ELVID) for the one of the plurality of logical volumes,” “receiving from the host computer a physical storage address for the one of the plurality of logical volumes,” and “using the ELVID to assure that an entity requesting access to the one of the plurality of logical

volumes is authorized to do so,” as recited in claim 15. The Office Action asserts that Cabrera discloses using an ELVID to assure that an entity requesting access to the one of the plurality of logical volumes is authorized to do so at column 5, lines 57-66, which reads in part, “[p]hysical media in a computer contains one or more logical volumes. The process of associating a logical volume with the **appropriate** underlying physical media is commonly referred to in the art as mounting (emphasis added).” The Office Action asserts that the limitation, “‘is authorized to do so’ reads on ‘appropriate’ indicating that a verification and matching occurs automatically within the system thereby authorizing the proper mount.” *See Office Action, page 14.* Applicant respectfully disagrees with this assertion.

The cited portion of Cabrera discloses mounting a logical volume. Mounting of a logical volume is a process completely unrelated to determining if an entity requesting access to one of the plurality of logical volumes is authorized to do so. While the Office Action asserts that ensuring that the logical volume is associated with the proper underlying physical media is tantamount to determining if an access to a logical volume is authorized, Applicant maintains that these are two unrelated concepts. For example, regardless of whether a logical volume is associated with the appropriate or inappropriate underlying physical media, the data on the underlying physical media (and thus, the data in the logical volume) may be still be accessed, as such an association has nothing to do with which entities are authorized to access the data. Cabrera is concerned with ensuring that a logical volume is associated with the correct underlying physical media, but is unrelated to determining what entities are permitted to access the data in the logical volume.

Further, Cabrera does not disclose receiving from a host computer an enterprise logical volume identifier (ELVID) for the one of the plurality of logical volumes,” or “receiving from the host computer a physical storage address for the one of the plurality of logical volumes,” as Cabrera relates to use with a single host computer and does not discuss sending or receiving any type of data from one host computer to another.

Thus, claim 15 patentably distinguishes over Cabrera. Accordingly, it is respectfully requested that the rejection of claim 15 under 35 U.S.C. §102(e) be withdrawn.

Claims 17-19 and 21-25 depend from claim 15 and are patentable for at least the same reasons. Accordingly, it is respectfully requested that the rejection of claims 16-25 under 35 U.S.C. §102(e) be withdrawn.

Claim 26

Claim 26 is directed to a host computer comprising: a processing unit; and an enterprise logical volume identifier (ELVID) interface module to transmit an access request for at least one of a plurality of logical volumes over a network, the access request including an ELVID for the at least one of the plurality of logical volumes and a respective physical storage location on one of a plurality of storage systems, the ELVID uniquely identifying the one of the plurality of logical volumes among the plurality of logical volumes and being usable to access the one of the plurality of logical volumes on at least two of the plurality of storage systems.

Cabrera fails to disclose or suggest an “ELVID interface module to transmit an access request over a network for at least one of a plurality of logical volumes, the access request including an ELVID for the at least one of the plurality of logical volumes and a respective physical storage location on one of a plurality of storage systems,” as recited in claim 26.

First, Cabrera fails to disclose a host computer that sends access requests over a network to one of a plurality of storage systems, the access request including an ELVID usable to access a volume on at least two storage systems. In the system of Cabrera, all accesses to logical volumes are performed within a single computer. Thus, there is no ELVID interface module in Cabrera and no sending of access requests over a network.

Second, Cabrera does not disclose an access request that includes an ELVID and a physical storage location. Cabrera discloses that files are accessed using user-friendly names (*see* Col. 6, lines 1-10), not by specifying a physical storage location of the file. Indeed, Cabrera is directed to ensuring that user-friendly names correspond to the correct logical volumes across boot sessions. Files in Cabrera are not accessed using both a user-friendly name (including a GUID) and a physical storage location. Files are accessed merely by specifying the user-friendly name.

Thus, Cabrera fails to disclose or suggest an ELVID interface module to transmit an access request, “including an ELVID for the at least one of the plurality of logical volumes and a respective physical storage location on one of a plurality of storage systems,” as recited in claim 26. Accordingly, it is respectfully requested that the rejection of claim 26 under 35 U.S.C. §102(e) be withdrawn.

Claim 27

Claim 27 is directed to a storage system for use in an enterprise comprising a plurality of storage systems coupled by a network, the plurality of storage systems to store a plurality of logical volumes, the storage system comprising: an input for receiving an access request that includes an enterprise logical volume identifier (ELVID) for a logical volume and a physical storage address that identifies one of the plurality of storage systems; a storage medium to store data corresponding to the plurality of logical volumes; and an ELVID verifier module to verify that the logical volume corresponding to the ELVID is stored on the one of the plurality of storage systems identified in the physical storage address, the ELVID uniquely identifying the correct one of the plurality of logical volumes among the plurality of logical volumes and being usable to access the correct one of the plurality of logical volumes on at least two of the plurality of storage systems.

As should be clear from the discussion above, Cabrera fails to disclose or suggest, “an enterprise logical volume identifier (ELVID) verifier module to verify that the logical volume corresponding to the ELVID is stored on the one of the plurality of storage systems identified in the physical storage address, the ELVID uniquely identifying the correct one of the plurality of logical volumes among the plurality of logical volumes and being usable to access the correct one of the plurality of logical volumes on at least two of the plurality of storage systems,” as recited in claim 27.

Thus, claim 27 patentably distinguishes over Cabrera. Accordingly, it is respectfully requested that the rejection of claim 27 under 35 U.S.C. §102(e) be withdrawn.

Claim 28 depends from claim 27 and is patentable for at least the same reasons. Accordingly, it is respectfully requested that the rejection of claim 28 under 35 U.S.C. §102(e) be withdrawn.

Claim 29

Claim 29 is directed to a storage system for use in an enterprise comprising a plurality of storage systems coupled by a network, the plurality of storage systems to store a plurality of logical volumes. The storage system comprises: a storage medium to store data corresponding to the plurality of logical volumes; and an enterprise logical volume identifier (ELVID) authorization module to verify that an access request to a physical storage location on the storage medium is received from an entity permitted to access one of the plurality of logical volumes with a corresponding ELVID, the ELVID uniquely identifying the one of the plurality of logical volumes among the plurality of logical volumes and being usable to access the one of the plurality of logical volumes on at least two of the plurality of storage systems.

As should be clear from the discussion above, Cabrera fails to disclose or suggest, “an enterprise logical volume identifier (ELVID) authorization module to verify that an access request to a physical storage location on the storage medium is received from an entity permitted to access one of the plurality of logical volumes with a corresponding ELVID,” as recited in claim 29. Accordingly, it is respectfully requested that the rejection of claim 29 under 35 U.S.C. §102(e) be withdrawn.

Claim 30 depends from claim 29 and is patentable for at least the same reasons. Accordingly, it is respectfully requested that the rejection of claim 30 under 35 U.S.C. §102(e) be withdrawn.

Claim 31

Claim 31 is directed to a computer system comprising: at least one host computer; a plurality of storage systems that store a plurality of logical volumes; means for receiving an access request to access data stored on one of the plurality of logical volumes, the access request

specifying an enterprise logical volume identifier (ELVID) for the one of the plurality of logical volumes and a physical storage address for the one of the plurality of logical volumes; and means for verifying that the one of the plurality of logical volumes corresponding to the ELVID is stored on the one of the plurality of storage systems specified in the physical storage address, the ELVID uniquely identifying the one of the plurality of logical volumes among the plurality of logical volumes and being usable to access the one of the plurality of logical volumes on at least two of the plurality of storage systems.

As should be clear from the discussion above, Cabrera fails to disclose or suggest, “means for verifying that the one of the plurality of logical volumes corresponding to the ELVID is stored on the one of the plurality of storage systems specified in the physical storage address,” as recited in claim 31. Thus, claim 31 patentably distinguishes over Cabrera. Accordingly, it is respectfully requested that the rejection of claim 31 under 35 U.S.C. §102(e) be withdrawn.

Claim 32

Claim 32 is directed to a computer system comprising: at least one host computer; a plurality of storage systems that store a plurality of logical volumes; and means for verifying that access requests to the plurality of logical volumes using an associated enterprise logical volume identifier (ELVID) are made by an entity authorized to access a requested one of the plurality of logical volumes, the ELVID uniquely identifying the requested one of the plurality of logical volumes among the plurality of logical volumes and being usable to access the requested one of the plurality of logical volumes on at least two of the plurality of storage systems.

As should be clear from the discussion above, Cabrera fails to disclose or suggest, “means for verifying that access requests to the plurality of logical volumes using an associated enterprise logical volume identifier (ELVID) are made by an entity authorized to access a requested one of the plurality of logical volumes,” as recited in claim 32. Accordingly, it is respectfully requested that the rejection of claim 32 under 35 U.S.C. §102(e) be withdrawn.

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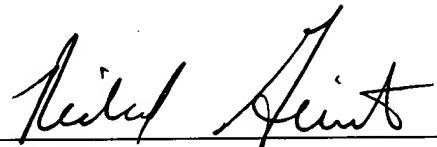
CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this request for reconsideration, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,

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